

Teaching Statement

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My motivation to teach stems from the fact that a teacher can have a significant role in shaping a student's ideas, motivations, and career directions. Having experienced this myself in high school, undergraduate, and graduate life, I can genuinely appreciate the long-lasting imprint teachers can leave on students – both in terms of research work and attitude. I look forward to teaching, guiding, counseling, and above all inspiring students. I have observed many bright students not being passionate about their work, and look forward to reviving their excitement in research. Conversely, I believe that an academic environment – through the constant influx of bright and creative minds – helps keep oneself motivated. Thus, teaching can often be symbiotic and quite rewarding.

Often, the instructor must induce interest in students in less popular courses. For instance, during the first two years of my undergraduate studies, we had to take courses from several areas, not directly related to computer science majors. A couple of us were particularly unresponsive to “electric circuits”, as we failed to see how it related to our purposes. Our instructor somehow managed to inculcate interest in most of us, and I eventually did appreciate the problem solving involved. I will therefore remain ardently motivated myself, to invoke students' interest.

The following paragraphs present different aspects of my teaching experience thus far – lecturing, testing, developing instructional material, and advising.

During my graduate studies, I was an instructor at the Department of Computer Science, the University of Mississippi, for two years, teaching courses in “Survey of Computing”, “Computer Organization”, “Programming for Engineers and Scientists – FORTRAN” and overview seminars on “Distributed Systems”. My responsibilities included preparing and delivering class lectures, assignments, and exams and grading. I was, at times, teaching two sections of a course each with forty students. The students were a diverse mix. For instance, the survey course included freshmen from the life sciences and returning adults with little experience in computers; the FORTRAN course primarily comprised sophomores, juniors, or seniors from engineering majors, to whom programming in FORTRAN was to be taught along with the programming concepts involved; the computer organization course comprised of junior/senior computer science majors and graduate students from engineering majors interested in architecture concepts, assembly language programming, and the interplay between hardware and software; and the seminars on distributed systems were for an operating system class, to whom distributed computing was to be introduced. The disparate goals of these courses meant different styles of lecturing, testing, and programming projects. This entire process has helped me hone my skills, switching from/to different levels, discussing issues with students at different levels, and advising.

Although different from traditional classroom teaching, the following have been valuable – two-year experience as Senior Technical Consultant, at Sair Linux and GNU Certification, an organization testing and certifying candidates worldwide on Linux System Proficiency; a six-month experience as Research Assistant, working on the National Classroom Project, funded by Microsoft Corporation, committed to bringing computing into classrooms.

With Linux certification, the testing was on different aspects of Linux system, network, and security administration, progressing to different levels of difficulty – for instance, a basic network exam would test the candidates ability to set up interfaces, and get connected to the Internet; while a more complex exam would test abilities to set up firewalls, intrusion detection, Web servers, and the like. At advanced levels candidates had to script, perform complex system administration tasks, understand file system structures, and process tables. My responsibilities included curriculum development (deciding which topics at what level of complexity), and test preparation. The intriguing aspect of this job was testing the candidates'

theoretical as well as practical knowledge of Linux, based on multiple-choice computerized exams (scenario style and case study questions). This has given me tremendous insight into the process of creative exam writing and the value of exams as a measurement of learning.

With the National Classroom Project, I was involved in the development of learning enhancement services for students and assessment services for teachers. The project addressed research for bringing computing into classrooms through the use of wireless hand-held devices, developing software systems for hand-held devices, developing testing environments through the World Wide Web, developing dynamic tests, and instructional material for different courses – C++, Operating Systems, Databases, etc. My involvement in this project has given me an appreciation for dynamic test construction, and online testing and learning environments.

Also during my graduate studies, I was involved in the developmental process of instructional material at different levels. For instance, I have reviewed books on System Administration from publishers such as, Thompson and Addison Wesley; reviewed lab exercise books such as “Kernel Projects for Linux” (practical projects on theoretical Operating System concepts), verifying correctness, studying their feasibility and suggesting alternative courses; developed content for books on Linux System, Network and Security Administration, published by John Wiley and Sons. This process has been of valuable assistance in learning to explain subject matter in an easy to understand manner.

During the early years of my dissertation, I was leading the development of a distributed Linux testbed at The University of Mississippi, exploring concepts in cluster communication, distributed file systems and load sharing environments, etc. My academic responsibilities included coordinating the work of several masters level students, guiding their projects, introducing them to distributed systems concepts, kernel programming/debugging intricacies, etc. This has given me an appreciation for the issues involved in student advising, and the time/effort required therein.

I feel confident that I can teach courses in fundamentals of computer science such as data structures, automata, operating systems, programming languages, C, object orientation, algorithms. I am particularly excited about the prospect of developing and teaching courses in my specialty – distributed operating systems, Internet-scale systems, and grid computing. I am interested in both basic and seminar-style courses in these areas. Although Grid computing brings a fresh wave of ideas, one cannot overlook the classical distributed systems research. This is characteristic of trends in computer science, wherein the phenomenal success of a product can overshadow decades of research. With this in mind, I would like to build and teach distributed systems with an *evolutionary perspective* – progressing from tightly coupled distributed operating systems to clusters to massively distributed wide-area Grid systems, volunteer computing systems and runaway virtual organizations.

With regard to my *teaching methodology*, I believe in lively lectures complemented by class participation. I also believe in frequent quizzing to help students come prepared for lectures; such quizzes can also act as a feedback about the effectiveness of lectures. Further, the constantly changing nature of technology demands that instructors update themselves both for their own improvement and to incite respect from students. I intend to achieve this by performing research in my area, being up to date with recent literature, and discussing ideas with colleagues and students. We often fall into comfortable patterns of thought, being complacent and thinking we know more about something than we really do. I hope to impress upon students that there are more ways to look at problems and also hope they help to “shake” me up intellectually. As part of this process, I believe it is important to be responsive to student queries both inside and outside the classroom and to demonstrate professionalism, while expecting the same from the students.

Having experienced the benefits of the freedom to pursue one’s ideas, and likewise the frustrations with the contrary, I realize the challenge of striving toward a balance between a constructive environment and one with considerable freedom. Finally, I will make an earnest attempt to combine theory with practice, bringing research projects into courses to demonstrate to the students the viability of the theory being imparted; develop thought-provoking assignments and projects; and construct exams and grading schemes that truly test a candidate’s understanding.